Machine Learning Prototype App for Recognition of Fruits

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The Problem

Background

- Increasing obesity[1] leads to necessity in understanding dietary choices of individuals
- Current electronic food trackers require participants to manually input meal descriptions
  - Difficult for researchers to standardize and analyze.

Current Food Tracker: MealLogger

Example Participant Meal Inputs	Researcher Follow-up Questions
Lunch I ate 1 plate of pasta with shrimp (5). 	What kind of pasta sauce?
Dinner homemade chow mein with vegetables and sausage 	What type of veggies and sausage?

Why MealLogger is not ideal:

- Manual input of descriptions by participants may not be detailed
- Inconsistent descriptions and ambiguous sizing difficult for analysis
- No way to keep track of participants' personal dietary needs and habits

Prototype

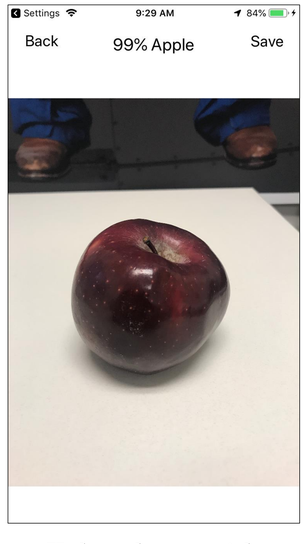
Goal

To implement machine learning into a meal tracking phone application to provide an easy and efficient method for both participants and researchers to label and analyze food items in a standardized fashion.

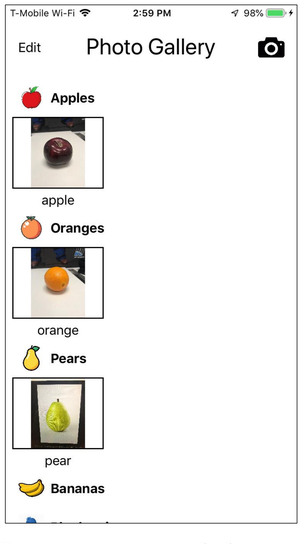
Methodology / Tools

- Turicreate - python module
  - Train a model to identify different types of fruits using a machine learning algorithm
- Xcode/Swift
  - iOS app development using CoreML and Vision modules

Features



Take photo with automatic labeling of fruits



Organizes saved data depending on type of fruit present

Next Steps

Future Implementations

Incorporate with NASA FEAST app

- FEAST = **F**ood **E**valuation **a**nd **S**ample **T**racking
- Record participant caloric intake, home saliva and urine samples
- Easy access and analysis for researchers

How machine learning will enhance FEAST

- Present potential identities of food found in photo and allow user to select detailed options
  - standardized descriptions
- Questionnaires prompting meal details based on recognized food type (ie: pasta sauce, type of meat)
- Built in model can learn to recognize user repetitive meal combinations (ie: pizza with soda, apple and oatmeal, etc.)
  - allow default options that participants can easily choose from
- Teach model to judge amount of food with a business card for reference

Acknowledgements

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Reference

Simon, Stacy (2018). Obesity rates continue to rise among adults in the US. *American Cancer Society*, www.cancer.org/latest-news/obesity-rates-continue-to-rise-among-adults-in-the-us.html.